



AMENDMENT AND RESPONSE UNDER 37 CFR § 1.114

Serial Number: 10/688,573

Filing Date: October 20, 2003

Title: SOFTWARE TOOL FOR SYNTHESIZING A REAL-TIME OPERATING SYSTEM

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**S/N 10/688,573**

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Serial No.:	10/688,573	Group Art Unit:	2196
Filed:	October 20, 2003	Docket No.:	Zeid-01
Title:	SOFTWARE TOOL FOR SYNTHESIZING A REAL-TIME OPERATING SYSTEM		

**AMENDMENT AND RESPONSE UNDER 37 CFR § 1.114**

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This Amendment and Response is filed in connection with a Request for Continued Examination and in response to the Final Office Action mailed on March 13, 2007. Please amend the above-identified patent application as follows.

**IN THE CLAIMS**

Please amend the claims as follows:

- 1) (Currently Amended) A method for developing a real-time operating system, comprising:
  - a) specifying a set of n tasks, task(1) through task(n), to be scheduled for execution, ~~at least one of the tasks of said set of n tasks being selectively configurable as a preemptive or a non-preemptive task;~~
  - b) specifying a scheduling algorithm for scheduling the execution of said set of n tasks; and
  - c) synthesizing source code ~~with embedded~~ from commands embedded in source code to implement a task scheduler that uses said scheduling algorithm ~~and said embedded commands~~ for controlling execution of said set of n tasks, said synthesized source code being executable on a target system after compilation.
- 2) (Currently Amended) The method of claim 1) ~~further~~ including specifying t init-tasks that are executed only once upon initial execution of said task scheduler, t being less than or equal to n.
- 3) (Currently Amended) The method of claim 1) ~~further~~ including specifying f f-loop tasks, each having an associated integer value ~~lc(i)~~ lc(i) for i ranging from 1 to f and f being less than or

equal to  $n$ , said task scheduler including a continuously executing loop such that each  $f$ -loop task executes exactly once every  $t(i)$  times that the loop is executed.

4) (Currently Amended) The method of claim 1) ~~further~~ including specifying  $p$   $p$ -loop tasks, each having an associated integer value  $t(i)$  for  $i$  ranging from 1 to  $p$  and  $p$  being less than or equal to  $n$ , the number  $t(i)$  representing a number of regular time units, said task scheduler including a timer that schedules each  $p$ -loop task  $i$  to be executed approximately once every  $t(i)$  time units.

5) (Currently Amended) The method of claim 1) ~~further~~ including specifying  $c$  call-tasks,  $c$  being less than or equal to  $n$ , said task scheduler scheduling a call-task when another task requests that said call-task be executed.

6) (Currently Amended) The method of claim 1) ~~further~~ including specifying  $r$  preemptive-tasks,  $r$  being less than or equal to  $n$ , said task scheduler including a timer mechanism that counts a specified period of time at which time if a preemptive-task is currently executing, the task's state is stored and execution is given to said task scheduler to schedule another task until a later time when the task scheduler restores the state of said preemptive-task and execution of said preemptive-task is continued.

7) (Previously Presented) The method of claim 1) where tasks are given priority values such that whenever the task scheduler chooses between scheduling multiple tasks, all of which being ready to be executed, said task scheduler chooses from among those tasks that have the highest priority values.

15. (Currently Amended) An apparatus for developing a real-time operating system comprising:

a computer;

a computer readable medium in data communication with the computer, the computer readable medium including a software synthesis program stored thereon, which when executed by the computer causes the computer to specify a set of  $n$  tasks, task(1) through task( $n$ ), to be scheduled for execution, ~~at least one of the tasks of said set of  $n$  tasks being selectively configurable as a preemptive or a non-preemptive task~~; specify a scheduling algorithm for scheduling the execution of said set of  $n$  tasks; and synthesize source code ~~with embedded from~~ commands embedded in source code to implement a task scheduler that uses said scheduling algorithm ~~and said embedded commands~~ for controlling execution of said set of  $n$  tasks, said synthesized source code being executable on a target system after compilation.

16. (Currently Amended) The apparatus of claim 15 being ~~further~~ configured to specify  $t$  init-tasks that are executed only once upon initial execution of said task scheduler,  $t$  being less than or equal to  $n$ .

17. (Currently Amended) The apparatus of claim 15 being ~~further~~ configured to specify  $f$   $f$ -loop tasks, each having an associated integer value  $k(i)$  for  $i$  ranging from 1 to  $f$  and  $f$  being less than or equal to  $n$ , said task scheduler including a continuously executing loop such that each  $f$ -loop task executes exactly once every  $k(i)$  times that the loop is executed.

18. (Currently Amended) The apparatus of claim 15 being ~~further~~ configured to specify  $p$   $p$ -loop tasks, each having an associated integer value  $t(i)$  for  $i$  ranging from 1 to  $p$  and  $p$  being less than or equal to  $n$ , the number  $t(i)$  representing a number of regular time units, said task scheduler including a timer that schedules each  $p$ -loop task  $i$  to be executed approximately once every  $t(i)$  time units.

19. (Currently Amended) The apparatus of claim 15 being ~~further~~ configured to specify  $c$  call-tasks,  $c$  being less than or equal to  $n$ , said task scheduler scheduling a call-task when another task requests that said call-task be executed.

20. (Currently Amended) The apparatus of claim 15 being ~~further~~ configured to specify  $r$  preemptive-tasks,  $r$  being less than or equal to  $n$ , said task scheduler including a timer mechanism that counts a specified period of time at which time if a preemptive-task is currently executing, the preemptive-task's state is stored and execution is given to said task scheduler to schedule another task until a later time when the task scheduler restores the state of said preemptive-task and execution of said preemptive-task is continued.

21. (Previously Presented) The apparatus of claim 15 wherein tasks are given priority values such that whenever the task scheduler chooses between scheduling multiple tasks, all of which being ready to be executed, said task scheduler chooses from among those tasks that have the highest priority values.

22. (Currently Amended) An apparatus for developing a real-time operating system comprising:

- a) means for specifying a set of  $n$  tasks, task(1) through task( $n$ ), to be scheduled for execution, ~~at least one of the tasks of said set of  $n$  tasks being selectively configurable as a preemptive or a non-preemptive task;~~
- b) means for specifying a scheduling algorithm for scheduling the execution of said set of  $n$  tasks; and
- c) means for synthesizing source code ~~with embedded~~ from commands embedded in source code to implement a task scheduler that uses said scheduling algorithm ~~and said embedded commands~~ for controlling execution of said set of  $n$  tasks, said synthesized source code being executable on a target system after compilation.

23. (Previously Presented) The apparatus of claim 22 including means for specifying  $t$  init-tasks that are executed only once upon initial execution of said task scheduler,  $t$  being less than or equal to  $n$ .

24. (Previously Presented) The apparatus of claim 22 including means for specifying  $f$   $f$ -loop tasks, each having an associated integer value  $lc(i)$  for  $i$  ranging from 1 to  $f$  and  $f$  being less than or equal to  $n$ , said task scheduler including a continuously executing loop such that each  $f$ -loop task executes exactly once every  $lc(i)$  times that the loop is executed.
25. (Previously Presented) The apparatus of claim 22 including means for specifying  $p$   $p$ -loop tasks, each having an associated integer value  $t(i)$  for  $i$  ranging from 1 to  $p$  and  $p$  being less than or equal to  $n$ , the number  $t(i)$  representing a number of regular time units, said task scheduler including a timer that schedules each  $p$ -loop task  $i$  to be executed approximately once every  $t(i)$  time units.
26. (Previously Presented) The apparatus of claim 22 including means for specifying  $c$  call-tasks,  $c$  being less than or equal to  $n$ , said task scheduler scheduling a call-task when another task requests that said call-task be executed.
27. (Previously Presented) The apparatus of claim 22 including means for specifying  $r$  preemptive-tasks,  $r$  being less than or equal to  $n$ , said task scheduler including a timer mechanism that counts a specified period of time at which time if a preemptive-task is currently executing, the preemptive-task's state is stored and execution is given to said task scheduler to schedule another task until a later time when the task scheduler restores the state of said preemptive-task and execution of said preemptive-task is continued.
28. (Previously Presented) The apparatus of claim 22 wherein tasks are given priority values such that whenever the task scheduler chooses between scheduling multiple tasks, all of which are ready to be executed, said task scheduler chooses from among those tasks that have the highest priority values.